Fast EtherLink® XL PCI 10/100BASE-TX Network Interface Card User Guide

Member of the 3Com Fast EtherLink XL family of network interface cards

http://www.3com.com/

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FCC CLASS B STATEMENT

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About This Guide

About This Guide provides an overview of this guide, describes guide conventions, and tells you where to look for specific information.

This guide describes how to install, configure, and troubleshoot the 3Com® Fast EtherLink® XL PCI 10/100BASE-TX network interface card (NIC). This NIC is called the 3C905B-TX NIC in this guide.

If the information in the README.TXT file on the EtherDisk® *diskette shipped with your product differs from the information in this guide, follow the instructions in the README.TXT file.*

Finding Specific Information in This Guide

This table shows where to find specific information in this guide.

If you are looking for	Turn to
NIC features and PC and server requirements	Chapter 1
Installation and cabling information	Chapter 2
Network driver installation instructions	Chapter 3
Troubleshooting	Chapter 4
Instructions for changing configuration settings	Chapter 5
Specifications and RJ-45 pin assignments	Appendix A
Technical support	Appendix B

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Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Important features or instructions
	Caution	Information to alert you to potential damage to a program, system, or device
	Warning	Information to alert you to potential personal injury

Table 2 Text Conventions

Convention	Description
`Commands`	The word "command" means you must enter the command exactly as shown in text and press the Return or Enter key. Example: To launch the DOS diagnostics, enter the following command: **`a: install`**
`Screen displays`	This typeface represents information as it appears on the screen.
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
Menu commands and *buttons*	Menu commands or button names appear in italics. Example: From the *Help* menu, select *Contents*.
Words in *italicized* type	Italics emphasize a point or denote new terms at the place where they are defined in the text.
Words in **bold-face** type	Bold text denotes key features.

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1 INTRODUCTION

The 3Com® 3C905B-TX network interface card (NIC) provides a high-performance connection to an Ethernet or Fast Ethernet network. This NIC operates at 100 Mbps or 10 Mbps automatically, depending on the speed of the connected hub.

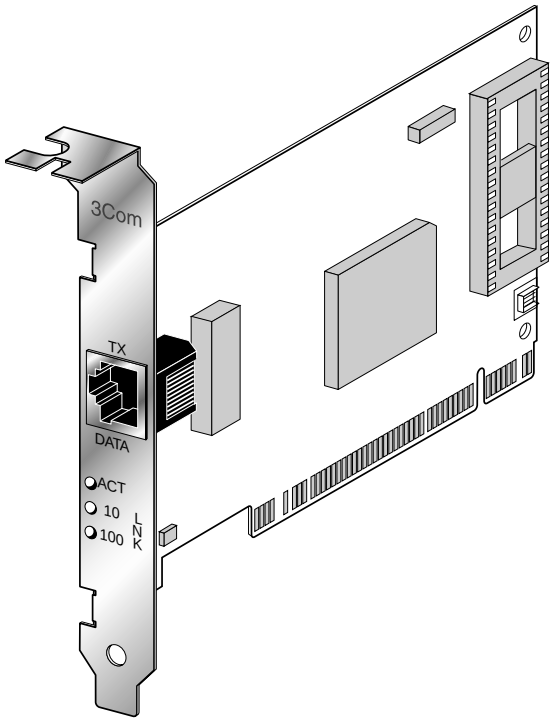

Figure 1-1 3C905B-TX NIC

There are two types of 3C905B-TX NICs: the 3C905B-TX NIC and the 3C905B-TX-NM NIC.

The 3Com Remote Wake-Up NIC (3C905B-TX), shown in Figure 1-1, operates as a wake-up NIC only in PCs with the Remote Wake-Up connector attached to the PC motherboard. This NIC provides a network connection with or without the Remote Wake-Up connector installed.

The 3C905B-TX-NM NIC does not have the Remote Wake-Up connector or functionality.

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Unless specifically indicated, the name 3C905B-TX is used throughout this guide to refer to both NICs.

This chapter describes the 3C905B-TX NIC features and PC and server requirements.

Industry-Leading Performance

The 3C905B-TX NIC provides the following performance features:

- Interactive Access technology to minimize CPU utilization
- Parallel Tasking® II architecture for high throughput and low processor utilization
- Full-duplex 10 Mbps and 100 Mbps support
- Hardware IP checksum enabled for better Internet and intranet performance
- Fast IP switching solution that allows you to cost-effectively scale internetwork performance as bandwidth requirements increase
- 32-bit bus master design with full scatter gather and infinite bursting performance
- Flow control (IEEE 802.1x), which optimizes performance in switched networks through efficient data transmissions

Dynamic*Access* Software

Dynamic*Access*™ software delivers intelligence at the edge of the network to optimize network performance and control.

Dynamic*Access* features include PACE™ Interactive Access technology, dRMON (distributed RMON) support, and support for PACE real-time and multimedia applications.

PACE class of service drivers enable prioritization of multimedia and business-critical applications like video conferencing and distance learning. With the 3Com PACE drivers, you can set the class of service for each application.

The 3C905B-TX NIC ships with dRMON SmartAgent® intelligent agents that collect remote management information used by the Transcend® Edge Monitor System. Together, they provide full RMON network management information for both switched and Fast Ethernet networks.

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Remote Wake-up

Remote Wake-Up support is enabled for the 3C905B-TX NIC. If you are using the 3C905B-TX NIC in a PC that supports Remote Wake-Up through the PCI bus, the 3Com NIC receives wake-up signals and wakes the PC from a sleep state.

Installation and Configuration

The 3Com NIC Diagnostics program allows you to test the 3C905B-TX NIC, configure it, and display the NIC configuration information. If you are running DOS, you cannot use this program.

The NIC Diagnostics Help system includes the 3C905B-TX Release Notes, Frequently Asked Questions, and KnowledgeBase.

Microsoft Windows 95 detects the 3C905B-TX NIC and installs the network driver from 3Com *EtherDisk Diskette #2*.

The AutoLink™ installation software automatically installs all Novell NetWare DOS ODI client software into your operating system.

10/100 Mbps Support

The single RJ-45 connector on the network cable supports 10 Mbps or 100 Mbps speeds.

NWay auto-negotiation enables the 3C905B-TX NIC to automatically run at the speed that the connected hub supports. The 3C905B-TX NIC works with products that comply with IEEE 10BASE-T and 100BASE-TX specifications.

PC and Server Requirements

Your PC or server must have:

- An 80386, 80486, Pentium, or Alpha processor

  Alpha processors or drivers work only with Windows NT 4.0
- An available bus mastering PCI slot
- A minimum of 640K of memory

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Make sure that you are running the latest BIOS for your PC or server, even if your PC is new. Contact your PC manufacturer for more information.

How Do I Install the 3C905B-TX NIC?

To complete installation, install the NIC in your PC or server, connect it to the network, and install the network driver. The installations steps are depicted in Figure 1-2.

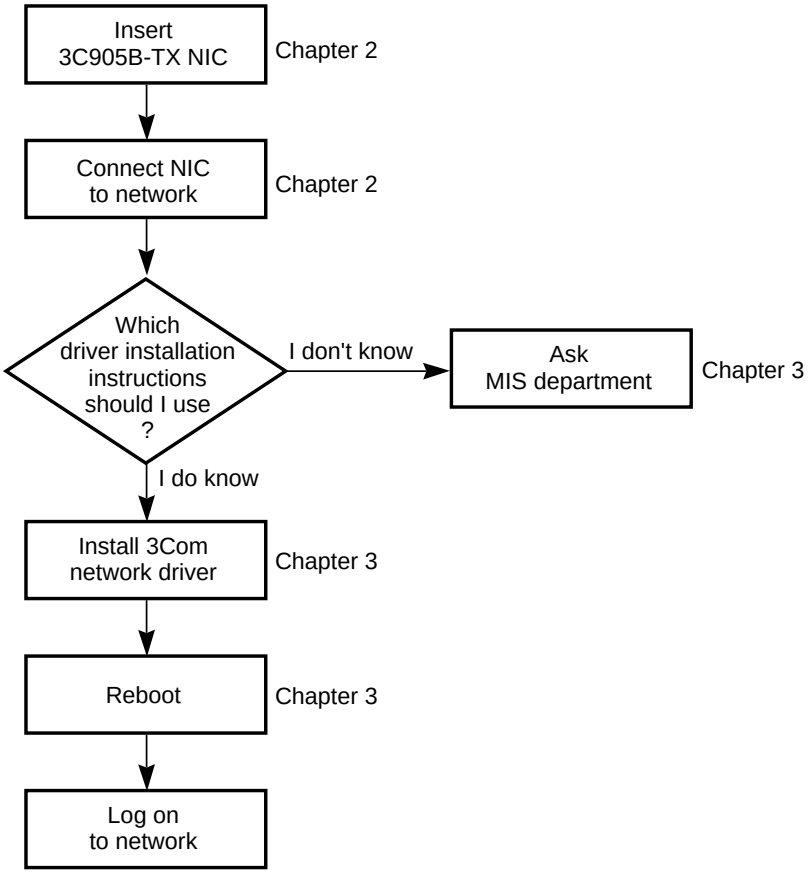

Figure 1-2 3C905B-TX NIC Installation Steps

Proceed to Chapter 2 to install the 3C905B-TX NIC in your PC or server and connect it to the network.

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2 INSTALLING THE NIC

There are two types of 3C905B-TX NICs: the 3C905B-TX NIC and the 3C905B-TX-NM NIC. They are both installed in your PC and connected to the network in exactly the same way.

After you connect the 3C905B-TX NIC to the network, you connect the Remote Wake-Up cable to the motherboard.

Before you begin, make sure that you also have the user guide and the 3C905B-TX *EtherDisk* diskettes, and that your PC meets the requirements described in Chapter 1.

CAUTION: *Each NIC is packed in an antistatic container to protect it during shipment. Before handling the NIC, touch the metal chassis of your PC. Maintain grounding by wearing a wrist strap attached to the chassis. Handle the NIC by its backplate and top edge. Do not touch the edge connector.*

To install the 3C905B-TX NIC in your PC or server and connect it to the network, follow these steps:

1. **Open the shipping container and inspect each item for damage.**
2. **Remove all jewelry from your hands and wrists. Use only insulated or nonconductive tools.**
3. **Unplug the PC and disconnect all cables.**
4. **Remove the PC cover.**
5. **Choose an empty bus mastering PCI slot.**

   A sample PCI slot is shown in Figure 2-1. If you do not know how to identify a PCI slot, check your PC documentation or ask your system administrator. In most PCs, slots 1 and 2 are bus mastering slots. Use slot 1 for the 3C905B-TX NIC if possible. If you have a video PCI card, install it in the last slot (the one farthest from slot 1).
6. **Unscrew the screw holding the PCI slot's backplate and remove it.**

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7 Insert the 3C905B-TX NIC into an empty PCI slot, shown in Figure 2-1.

Make sure that the NIC is firmly seated in the slot.

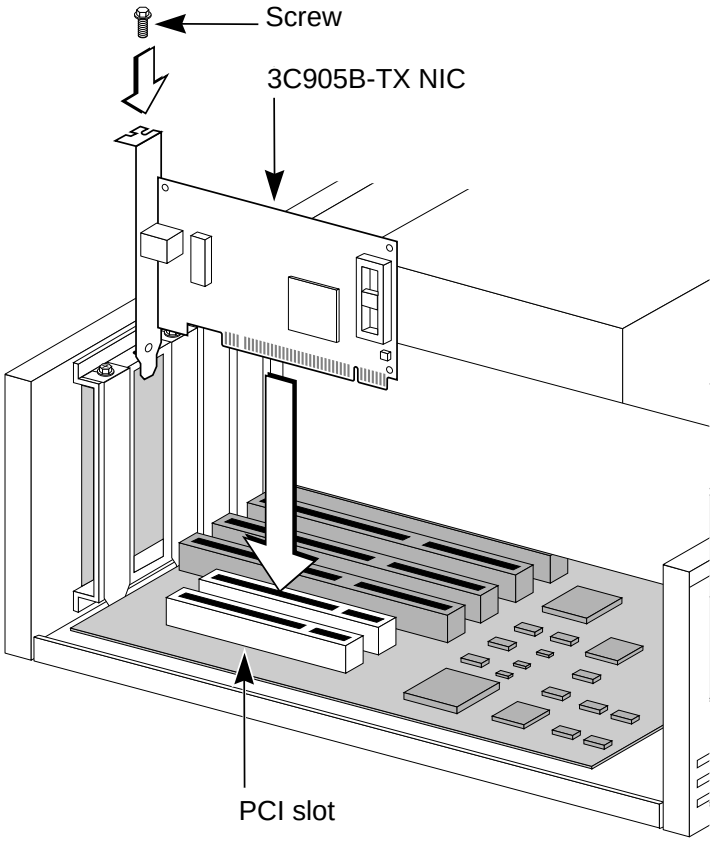

Figure 2-1 Inserting the NIC

8 Secure the NIC with the screw you removed earlier.

If you are installing the Remote Wake-Up connector, go to "Connecting the Remote Wake-up Cable" at the end of the chapter before replacing the PC cover.

9 Replace the PC cover and reconnect all previously connected cables.

10 Turn on the power to the PC.

11 Proceed to the next section, "Connecting to the Network."

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Connecting to the Network

You must connect the NIC to the network before installing the network driver. To connect the 3C905B-TX NIC to the network cable, follow these steps:

1 Connect the network cable to the RJ-45 port on the 3C905B-TX NIC, as shown in Figure 2-2.

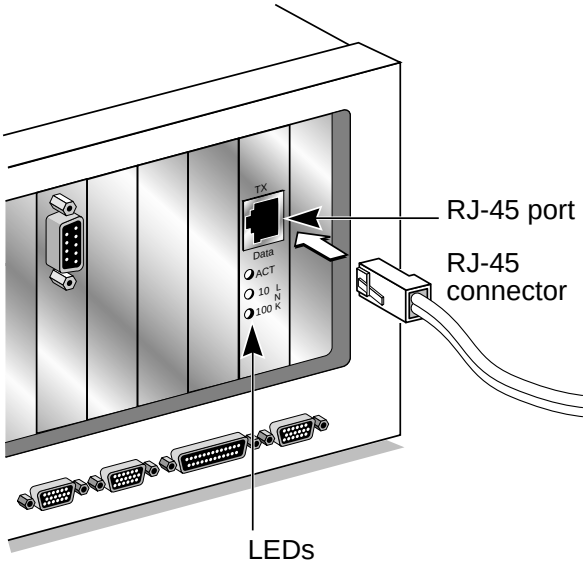

Figure 2-2 Connecting the Network Cable to the RJ-45 Port

2 Connect the other end of the network cable to a 10BASE-T or a 100BASE-TX network port.

3 Check the LEDs, shown in Figure 2-2.

After installation, and before you install the network driver, the LEDs indicate the following:

- 10 LNK LED - green - 10 Mbps link integrity
- 100 LNK - green - 100 Mbps link integrity
- ACT LED - OFF - until the network driver is installed

See Table 4-1 for more LED information. If you are not installing the Remote Wake-Up cable, go to Chapter 3 to install the network driver.

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Connecting the Remote Wake-up Cable

WARNING: *Install the NIC in slot 1 in the PC (as described earlier) before plugging in the 3-pin connector. Only properly trained and authorized personnel should perform service. Contact your PC manufacturer for information about safe service techniques.*

1 Insert the cable into the connector on the NIC, shown in Figure 2-3.

Twist the cable twice before attaching the cable to the motherboard.

2 Attach the cable to the connector on the PC motherboard, as shown in Figure 2-3.

The connector is located in different locations depending on the PC.

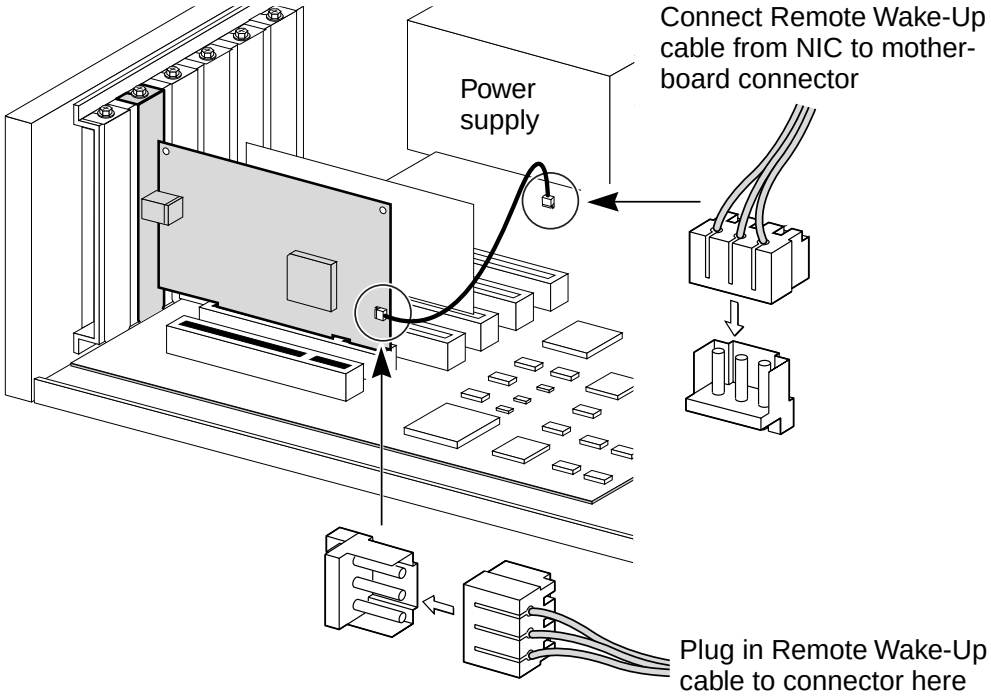
Connect Remote Wake-Up cable from NIC to mother-board connector
Power supply
Plug in Remote Wake-Up cable to connector here

Figure 2-3 Connecting the NIC to the Connector

3 Reconnect all cables and replace the PC cover.

The 3C905B-TX Remote Wake-Up NIC is installed. Go back to the previous section "Connecting to the Network" to complete installation.

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3 INSTALLING THE NETWORK DRIVER

This chapter describes how to install the network driver that completes your PC connection to the network. The 3C905B-TX software is installed with the network driver.

Instructions are provided for Windows 95, Windows NT, and NetWare DOS client and server driver installation. Table 3-1 provides a complete list of supported drivers and text files that describe how to install them.

Go to the section your MIS department recommends and follow the instructions to install the network driver on your PC.

You can obtain the latest network drivers on 3Com's World Wide Web site. To access the Web site, enter the 3Com URL into your Internet browser:

`http://infodeli.3com.com/infodeli/swlib/n_i_c.htm/`

The drivers are in the Support area. On the Support Welcome screen, scroll down to *Latest Drivers* and click.

Windows 95

This section describes how to install the network driver when your PC is running Windows 95. This driver supports dRMON and PACE technology.

This driver can be used in Microsoft and NetWare environments, and instructions are included for both.

You need the Windows 95 system installation files (CAB files) to complete the installation.

Do not use the AutoLink software to install the driver if you are running Windows 95.

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Follow these steps to install the network driver in a PC running Windows 95:

1 **Install and configure Windows 95 before installing the 3C905B-TX NIC.**

2 **Install the 3C905B-TX NIC and connect it to the network, as described in Chapter 2.**

3 **Restart the PC.**

Windows 95 automatically detects the NIC in the PC.

If Windows 95 does not detect the 3C905B-TX NIC, see Chapter 4, "Troubleshooting."

4 **Select *Driver from disk provided by the hardware manufacturer* and click *OK*.**

5 **Insert *EtherDisk Diskette #2* in your drive and, if the diskette is in drive A, click *OK*.**

Otherwise, supply the correct drive letter and click *OK*.

Once the 3Com installation files are read, Windows 95 prompts you for the Windows 95 network installation files.

6 **Enter the correct path to the Windows 95 files (CAB files) and click *OK*.**

If Windows prompts you to reboot, click *No*.

7 **Open the Windows 95 Control Panel.**

8 **In the Control Panel, double-click *Network*.**

The Network screen appears.

9 **For Microsoft networks, select the Configuration tab. For Novell NetWare networks, go to step 10.**

The default Microsoft network setup contains the following components:

```
Client for Microsoft Networks
Client for Novell Networks
3Com EtherLink XL Adapter
3Com dRMON SmartAgent PC software
IPX/SPX compatible protocol
NetBEUI protocol
```

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If a protocol is missing, follow these steps:

a Select the protocol and click *Add*.

b From the *Select Network Protocol* menu, select *Microsoft* in the left pane. In the right pane, select the protocol and click *OK*.

If a client is missing, follow these steps:

a Select the client and click *Add*.

b From the *Select Network Client* menu, select *Microsoft* in the left pane, select the client in the right pane, and click *OK*.

10 For NetWare only, on the Network screen, remove the following network components, if present:

```
Microsoft Client for Microsoft Network NetBEUI
```

The network components should now include:

```
Client for NetWare Networks
3Com EtherLink XL Adapter
3Com dRMON SmartAgent PC software
IPX/SPX Compatible Protocol
```

If a protocol is missing, follow these steps:

a Select the protocol and click *Add*.

b From the *Select Network Protocol* menu, select *Microsoft* in the left pane. In the right pane, select the protocol and click *OK*.

If a client is missing, follow these steps:

a Select the client and click *Add*.

b Select *Microsoft*.

c Click *Client for NetWare Networks* and then *Properties*.

To select the NetWare server, follow these steps:

a Under the General tab, set your preferred server and the first network drive and click *OK*.

b Set the primary network logon to *Client for NetWare Networks* and click *OK*.

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11 When the configuration is correct, click the Identification tab.

- The computer name is the name of your PC. Give your PC a unique name of up to 15 characters. The PC name cannot include blank spaces.
- A workgroup (such as your department) is composed of the PCs you usually communicate with and the workgroup's shared resources (such as printers).
- If you use peer group networking, the workgroup name is your peer group. Peers can see each other when they look in the Network Neighborhood.

  For information on peer-to-peer networking, see the W95NDIS3.TXT file in the HELP directory on *EtherDisk Diskette #1*.
- Your computer description is visible to other members of your workgroup in the Network Neighborhood.

12 Click *OK.*

The network connection is configured. Windows 95 prompts you to restart the PC.

13 Click *Yes*.

After the PC restarts, you can log on to your network. If you have problems, see Chapter 4.

Confirming Installation

Complete the following procedure to confirm that the 3C905B-TX NIC is properly installed:

1 Double-click the *My Computer* icon.

2 Double-click the *Control Panel* icon.

3 Double-click the *System* icon.

The System Properties box appears, detailing your system setup.

4 Click the Device Manager tab.

A list of devices appears, arranged by type.

5 Double-click *Network Adapters*.

The name of the installed 3C905B-TX NIC appears:

```
3Com EtherLink XL Adapter (3C905B)
```

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6 **Double-click the 3C905B-TX name to display a description of the 3C905B-TX NIC and its current status.**

The dialog box confirms that the 3C905B-TX NIC is working properly. If a yellow exclamation point or a red X appears next to the 3Com EtherLink XL adapter name, go to "Frequently Asked Questions" in Chapter 4 to troubleshoot the NIC.

7 **Click *Cancel* to leave each dialog box and return to the Control Panel.**

Windows NT

This section describes how to install the network driver in a PC running Windows NT versions 4.0 or 3.51.

Do not use the AutoLink software to install the driver if you are running Windows NT.

Before you begin, obtain *EtherDisk Diskette #2* and Windows NT installation files (on hard disk, diskettes, or CD).

If Windows NT networking is not installed, you may also need the following information from your MIS department:

- Whether you are on a LAN or are connecting to one through a modem
- Protocol used in the Microsoft Windows Network (typically TCP/IP or NetBEUI)
- Name of the Windows NT server domain or workgroup you belong to
- IP address if you are not using DHCP

Windows NT Version 4.0

If you already have the 3C905B-TX network driver and want to update it, follow the instructions provided in the next section.

Updating the Network Driver

To update the driver, follow these steps:

1 **Install the 3C905B-TX NIC and connect it to the network, as described in Chapter 2.**

2 **Restart the PC and start Windows NT.**

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3 **In the Control Panel, double-click *Network*.**

4 **In the Network window, select the Adapter tab.**

5 **Select *3Com EtherLink XL NIC*.**

6 **Click *Update*.**

7 **Insert *EtherDisk Diskette #2*.**

The driver is updated.

Installing the Network Driver

Follow these steps to install the network driver in a PC running Windows NT version 4.0:

1 **Install the 3C905B-TX NIC and connect it to the network, as described in Chapter 2.**

2 **Restart the PC and start Windows NT.**

3 **In the Control Panel, double-click *Network*.**

4 **In the Network window, select the Adapter tab.**

If this 3C905B-TX NIC is replacing a NIC already installed, follow these steps:

a Select the existing 3Com NIC (that is being replaced) in the Installed Adapters group.

b Click *Remove*.

c Click *Yes* in the Warning dialog box.

d Reboot the PC and repeat steps 2, 3, and 4.

5 **Click *Add Adapter*.**

6 **In the Select Network Adapter window, select *Have Disk*.**

7 **Insert *EtherDisk Diskette #2* in drive A and in the Insert Disk window, click *OK*.**

8 **In the Select OEM Option box, select *3Com EtherLink Adapter (3C905B)*.**

9 **Click *OK*.**

10 **Select the Protocol tab.**

11 **Select the appropriate protocol for your network.**

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12 In the Network Settings window, click *Close*.

If you are prompted for network information, enter the information supplied by your MIS department.

Windows NT prompts you to reboot.

13 Click *Yes* to restart your PC.

The driver installation is complete.

To confirm successful installation, double-click the *Network* icon in the Control Panel. Click the Adapters tab. The 3C905B-TX NIC should appear in the list. If it does not appear, see Chapter 4 for troubleshooting information.

Windows NT Version 3.51

If you already have the 3C905B-TX network driver and want to update it, follow the instructions provided in the next section.

Updating the Network Driver

To update the driver, follow these steps:

1 Install the 3C905B-TX NIC and connect it to the network, as described in Chapter 2.

2 Restart the PC and start Windows NT.

3 In the Control Panel, double-click *Network*.

4 Select the 3Com adapter and click *Properties*.

5 Record the settings for the NIC resources.

6 Click *Cancel.*

7 Double-click *Network* again in the Control Panel.

8 In the list of Network Software and Adapter Cards, select the 3Com adapter.

9 Click *Update*.

10 When prompted, enter the directory path (a:\), insert *EtherDisk Diskette #2*, and click *OK*.

11 Click *OK* to close the Network dialog box and complete the process.

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Installing the Network Driver

Follow these steps to install the network driver in a PC running Windows NT version 3.51:

1. **Install the 3C905B-TX NIC and connect it to the network, as described in Chapter 2.**
2. **Restart the PC and start Windows NT.**
3. **In the Control Panel, double-click *Network*.**
4. **In the Network Settings window, click *Add Adapter.***
5. **In the Add Network Adapter window, select *<Other> Requires disk from manufacturer*.**
6. **Click *Continue*.**
7. **Insert *EtherDisk Diskette #2* in drive A and click *OK*.**
8. **In the Select OEM Option box, select *3Com EtherLink XL PCI Adapter (3C905B)*.**
9. **Click *OK*.**

   The Bus Location window appears.
10. **Click *OK*.**

    Windows NT copies the files from *EtherDisk Diskette #2*.

    If you are prompted for network information, contact your MIS department for the requested information.
11. **In the Network Settings Change window, click *OK*.**

    Windows NT completes the installation.
12. **Click *Restart* to restart your PC.**

    If you have problems, see Chapter 4 for troubleshooting information.

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NetWare for Windows 3.1x, Windows for Workgroups, and DOS

The AutoLink program installs DOS client software and drivers for Novell NetWare in Windows 3.1x, Windows for Workgroups 3.11, and DOS environments.

CAUTION: *Do not use the AutoLink program if you are running Windows 95 or Windows NT.*

The AutoLink program modifies the CONFIG.SYS and AUTOEXEC.BAT files. It logs on to the server and updates the client software if your MIS department has already configured a 3Install account on your server.

AutoLink Requirements

To use the AutoLink program, your computer should have only one 3C905B-TX NIC installed and have 1 MB of free hard disk space.

Running the AutoLink Program

1. **Install the NIC and connect it to the network, as described in Chapter 2.**
2. **Reboot, using a DOS diskette.**
3. **Insert *EtherDisk Diskette #1* in drive A.**
4. **Run the Install program. Enter:**

   `a:install`

   This opens the main menu.
5. **From the main menu, select *Auto Install and Config for NetWare (AutoLink)* and press Enter.**
6. **Select *DOS*, *Windows 3.1x*, or *Windows for Workgroups 3.11* and follow the instructions.**
7. **When the auto installation process is finished, remove *EtherDisk Diskette #1* and reboot the PC.**

If you are running Windows 3.1x, after you connect to the NetWare server, run the WSINSTALL program for full Windows support. Contact your MIS department for the location of this NetWare utility.

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If you experience problems that occur only when using the AutoLink program, display or print the AUTOLINK.LOG file. The AUTOLINK.LOG file contains a list of all the events that occurred during the AutoLink installation and configuration process.

- To display the file, enter:

  ```
  type autolink.log | more
  ```

- To print the file, enter:

  ```
  print autolink.log
  ```

Installing the Novell NetWare Server Driver

This driver is installed on a Novell NetWare *server* running NetWare 4.1.

The \NWSERVER subdirectory on *EtherDisk Diskette #1* contains the driver (3C90X.LAN file) and NetWare Loadable Modules (NLMs) needed for NetWare 4.1.

The NetWare server driver can also be used on a NetWare version 3.12 server. Contact Novell to obtain the NLM files and for instructions for installing the driver in a 3.12 environment. The NetWare 3.11 server is not supported by the 3C905B-TX NIC.

NetWare Version 4.1

This section describes how to install the NetWare server driver on *EtherDisk Diskette #1* on a NetWare version 4.1 server.

To import the server driver into a NetWare 4.1 server, follow these steps:

1. **Install the NetWare server software.**
2. **When the *NIC Selection* menu appears, insert *EtherDisk Diskette #1* in the drive.**
3. **Press Insert to add a driver externally.**
4. **Press F3 to change the path.**

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5 **At the A:\ prompt, enter:**

```
nwserver
```

The installation program gathers the files and prompts you for a NIC selection.

6 **Select *3Com Fast EtherLink XL 10/100 Ethernet NIC*.**

7 **Press Enter to continue the server installation.**

Multiple NICs

To support more than one NIC in a server, edit the AUTOEXEC.NCF file to the following format:

```
load C:\SERVER\3C90X.LAN PORT=<port1>
NAME=<name1> FRAME=<frametype>
load C:\SERVER\3C90X.LAN PORT=<port2>
NAME=<name2> FRAME=<frametype>
```

Port1 and port2 are the 3C905B-TX NIC's PCI port addresses, and name1 and name2 are user-specified names assigned to distinguish the multiple NICs.

The FRAME parameter is optional. The default frame type is Ethernet_802.2. If you want the ODI server driver to support more than one frame type, then both the unique NAME= and FRAME= parameters must be paired on each load driver line. The valid frame types are Ethernet_802.2, Ethernet_802.3, Ethernet_II, and Ethernet_SNAP.

The protocols must be bound to the specific driver configuration using the user-assigned unique names. The following example shows how this can be done:

```
load C:\SERVER\3C90X.LAN PORT=1000
FRAME=Ethernet_802.3 NAME=ADPONE
load C:\SERVER\3C90X.LAN PORT=2000
FRAME=Ethernet_II    NAME=ADPTWO
bind IPX to ADPONE
bind IPX to ADPTWO
```

The examples used may require other parameters to work properly. Consult the appropriate Novell NetWare manuals for details.

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Supported Network Drivers

Table 3-1 provides the text file names and driver names for supported network drivers. These text files describe how to install the network driver and are located in the HELP directory on *EtherDisk Diskette #1*.

Table 3-1 Network Driver Text File Names

Network Operating System	Text File Name	Network Driver Name
Windows 95	W95NDIS.TXT	EL90XND3.SYS/ EL90XND4.SYS
Windows 95 NDIS 2	W95NDIS2.TXT	EL90X.DOS
Windows NT	WINNT.TXT	EL90XND3.SYS/ EL90XND4.SYS
NetWare Client 32	CLIENT32.TXT	3C90X.LAN
NetWare 4.1 Server	NETWARE.41X	3C90X.LAN
NetWare OS/2	NWOS2ODI.TXT	3C90X.SYS
NetWare client for DOS, Windows 3.1, and Windows for Workgroups	AUTOLINK.TXT (NETWARE directory)	3C90X.COM
Windows for Workgroups (NetWare)	WFWNETWR.TXT	3C90X.COM
Windows for Workgroups (NDIS 2)	WFWNDIS2.TXT	EL90X.DOS
Windows for Workgroups (NDIS 3)	WFWNDIS3.TXT	EL90X.386
Banyan VINES	BANYAN.TXT	EL90X.DOS
Microsoft LAN Manager	LANMAN.TXT	EL90X.DOS
IBM LAN Server (DOS)	LANSRV.TXT	EL90X.DOS
IBM LAN Server (OS/2)	LANSRV.TXT	EL90X.OS2
Artisoft LANtastic	LANTASTK.TXT	EL90X.DOS
DEC PATHWORKS	PATHWORK.TXT	EL90X.DOS (DOS) and 3C90X.COM (NetWare)

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4 TROUBLESHOOTING

This chapter explains how to isolate and solve NIC problems, including the following topics:

- Status LEDs
- 3Com NIC Diagnostics program
- Accessing the 3C905B-TX Help system
- 3Com support services
- Removing the 3C905B-TX software
- Checking Remote Wake-Up
- Crossover cable troubleshooting tips
- Frequently Asked Questions
- Accessing the 3Com World Wide Web page

The 3Com World Wide Web site offers the latest drivers, troubleshooting information, and software updates in the Support area. To access the Web site, enter the 3Com URL address into your Internet browser:

`http://infodeli.3com.com/infodeli/swlib/n_i_c.htm/`

Status LEDs

Before the LEDs can be used for troubleshooting, the NIC must be connected to the network (Chapter 2) and the network driver must be installed (Chapter 3).

The 3C905B-TX NIC has three status LEDs, as shown in Figure 4-1 and described in Table 4-1.

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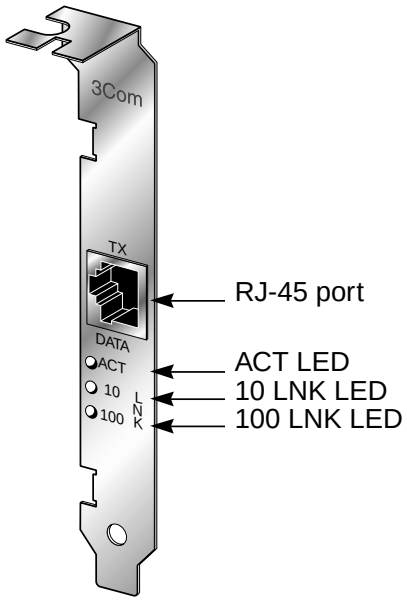

Figure 4-1 LEDs

Table 4-1 LED Descriptions

LED	Description	Flashing	Steady	Off
10 LNK	Green: Link integrity	Reversed polarity	Good 10BASE-T connection between NIC and hub	No connection between NIC and hub
100 LNK	Green: Link integrity	Reversed polarity	Good 100BASE-TX connection between NIC and hub	No connection between NIC and hub
ACT	Yellow: Port traffic for either speed	Network traffic present	Heavy network traffic	No traffic

3Com NIC Diagnostics Program

Use the 3Com NIC Diagnostics program for Windows 95 and Windows NT to test the 3C905B-TX NIC and change configuration. To change the NIC's configuration, see Chapter 5. If you are running NetWare Client 32 with the NetWare ODI driver, use the DOS diagnostic program described in the INSTRUCT.TXT file in the HELP directory on *EtherDisk Diskette #1*.

The 3Com NIC Diagnostics program is installed with the driver. Driver installation is described in Chapter 3. You must install the driver before you run the program.

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Accessing the 3C905B-TX Help System

You can display the 3C905B-TX NIC Help system, a Windows Help application that includes 3C905B-TX Release Notes, Frequently Asked Questions, and the 3C905B-TX KnowledgeBase. The Help system was installed with the network driver.

To display the 3Com Help system, follow these steps:

1. **Install the 3C905B-TX NIC, connect it to the network (Chapter 2), and install the driver (Chapter 3).**
2. **Click the Windows *Start* menu.**
3. **Select *Programs*.**
4. **Select *3Com NIC Utilities*.**
5. **Select *3Com NIC Diagnostics Help*.**

   The Help screen for the 3Com NIC Diagnostics General screen appears.
6. **Click the links to display information about each of the 3Com NIC Diagnostics screens.**

Displaying Release Notes, Frequently Asked Questions, and the KnowledgeBase

To access the Release Notes, Frequently Asked Questions, and KnowledgeBase information, follow these steps:

1. **Click the Support tab, shown in Figure 4-2.**
2. **Click the *Release Notes* button on the Support screen.**

   The Release Notes Help screen appears.
   - Click the *Release Notes* link to display tips about installing and using the 3C905B-TX NIC.
   - Click the *Frequently Asked Questions* link to display common questions asked by customers and answered by 3Com support experts.
   - Click the *KnowledgeBase* link to display 3C905B-TX NIC compatibility topics.

To display the entire Help system, click the Help button on each NIC Diagnostics screen. To display information about any item on each screen, click the question mark (?), drag it to the item, and click. The pop-up box displays information about the selected item.

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Running the NIC Self-Test

Run the NIC self-test to check the physical components, connectors, and circuitry on the NIC.

1. **Make sure that the 3C905B-TX NIC is installed and connected to the network (Chapter 2) and the network driver is installed (Chapter 3).**
2. **Start the 3Com NIC Diagnostics program by clicking the Windows *Start* menu.**
3. **Select *Programs*.**
4. **Select *3Com NIC Utilities*.**
5. **Select *3Com NIC Diagnostics*.**

   A warning message appears. Click *OK* to disconnect your PC from the network to conduct this test.

   The 3Com NIC Diagnostics General screen appears, as shown in Figure 4-2.

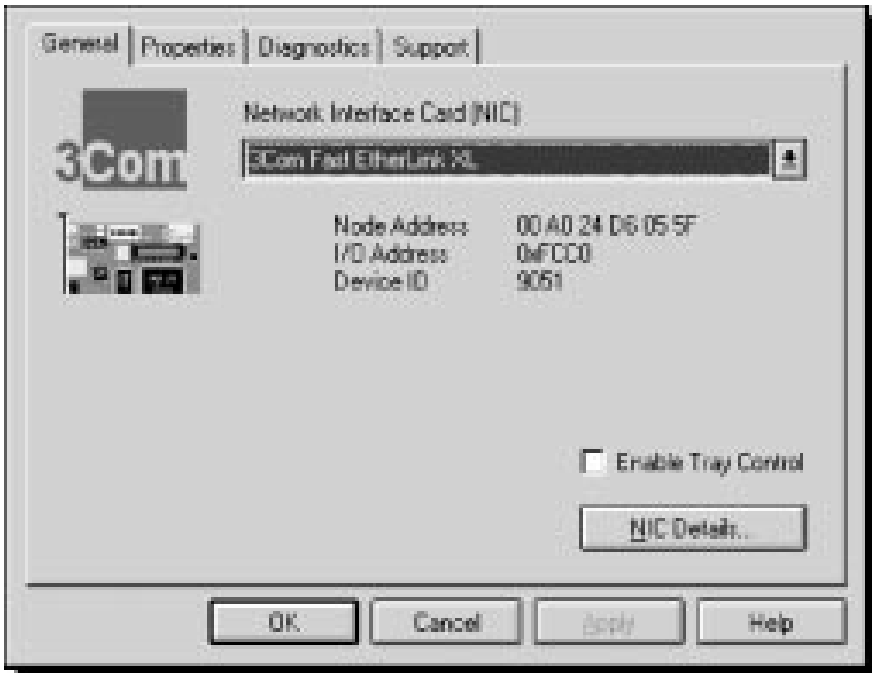

Figure 4-2 3Com NIC Diagnostics Program General Screen

To access the 3Com NIC Diagnostics program later by clicking its icon in the system tray, click the check box next to Enable Tray Control.

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6 Click the Diagnostics tab to display the Diagnostics screen, shown in Figure 4-3.

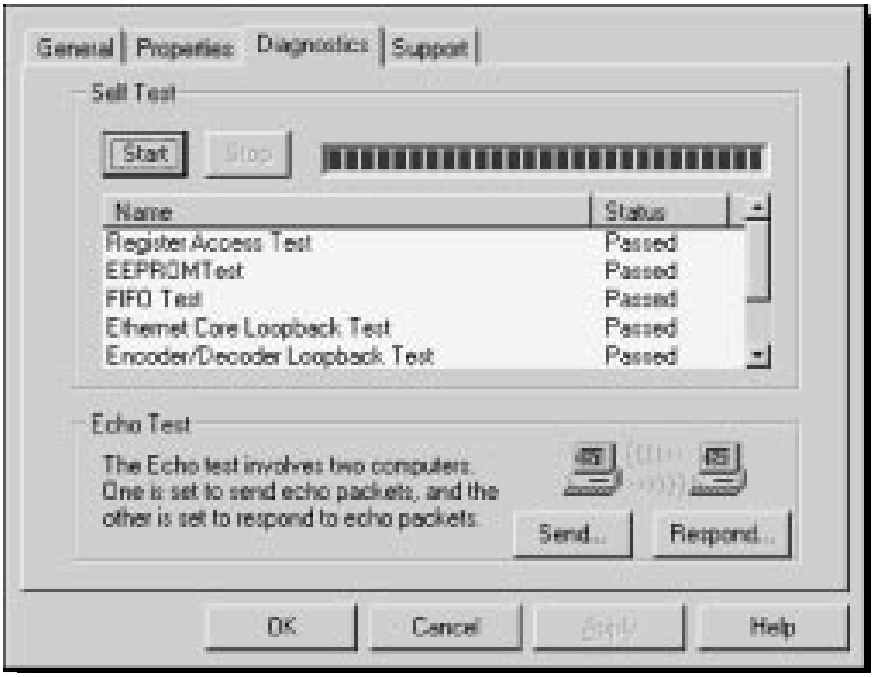

Figure 4-3 Diagnostics Screen

7 Click *Start* in the Self-Test area.

The following tests run in sequence:

- Register Access
- EEPROM
- FIFO
- Ethernet Core Loopback
- Encoder/Decoder Loopback
- Interrupt

You can click *Stop* to stop the tests. Otherwise, the tests run continuously to completion.

Click the Help button to display help for this screen. Click the question mark (?) at the top of the screen, drag it to a test, and click. The pop-up box displays information about the selected test and what to do if the test fails.

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Running the Echo Test

The echo test tests the 3C905B-TX NIC's ability to transmit and receive data while on the network.

You need two PCs with 3Com NICs installed to run an echo test: one PC to send data and one PC to receive data.

CAUTION: *Running the echo test while connected to an active network can cause intermittent failures. To avoid this, connect to an inactive network on which only the PC being tested is operating.*

To run the echo test, follow these steps:

1. **Make sure that the 3C905B-TX NIC is installed in the sending PC and connected to the network (Chapter 2) and that the network driver is installed (Chapter 3).**
2. **Install a 3C905B-TX NIC in another PC (the echo server), connect it to the network, and install the network driver.**

   The echo server PC is the *responding* PC.
3. **On both PCs:**
   - **a** Click the Windows *Start* menu.
   - **b** Select *Programs*.
   - **c** Select *3Com NIC Utilities*.
   - **d** Select *3Com NIC Diagnostics*.
   - **e** Click the Diagnostics tab to display the Diagnostics screen, shown in Figure 4-3.
4. **Click *Respond* on the Diagnostics screen (Figure 4-3) of the responding PC.**

   The Echo Test Responder screen appears on the responding PC.
5. **Click *Start* on the Echo Test Responder screen.**
6. **On the Diagnostics screen (Figure 4-3) of the sending PC, click *Send*.**
7. **On the Diagnostics screen (Figure 4-3) of the sending PC, click *Start*.**

   The statistics for the test appear in the Statistic section of the window.

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Click the Help button to display Help for this screen. Click the question mark (?) at the top of the screen and drag it to a statistic and click. The pop-up box displays information about the selected statistic.

3Com Support Services

The 3Com NIC Diagnostics Program Support screen, shown in Figure 4-4, provides access to the following support services:

- 3Com NIC Diagnostics program
- 3C905B-TX NIC Release Notes
- 3Com BBS telephone numbers and modem speeds
- 3Com World Wide Web information
- 3Com problem report generator

1 To access the 3Com NIC Diagnostics support screen, click the Support tab on the 3Com NIC Diagnostics program main screen, shown in Figure 4-2.

The 3Com NIC Diagnostics Program Support screen appears, shown in Figure 4-4.

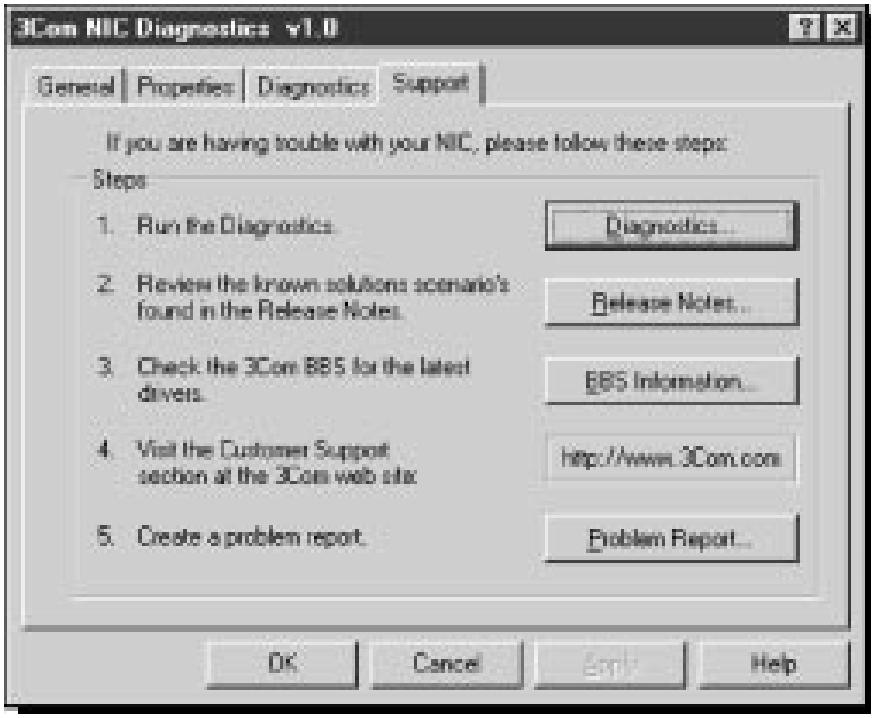

Figure 4-4 3Com NIC Diagnostics Program Support Screen

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- Click *Diagnostics* to run the 3Com NIC Diagnostics program. Refer to the beginning of this chapter for information on how to use the 3Com NIC Diagnostics program.
- Click *Release Notes* to display the 3C905B-TX Release Notes, Frequently Asked Questions, and the 3C905B-TX KnowledgeBase.
- Click *BBS Information* to display the BBS telephone numbers and modem speeds.
- *The http...* button displays the 3Com World Wide Web address.
- Click *Problem Report* to generate a 3Com problem report.

Generating a Problem Report

The problem report generator prompts you for the information that will help 3Com customer support solve your 3C905B-TX NIC installation and configuration problems. You can e-mail the completed report to 3Com customer support and receive an e-mail answer within 2 business days.

To generate a problem report, follow these steps:

1 **Click *Problem Report* on the 3Com NIC Diagnostics Program Support screen shown in Figure 4-4.**

The Problem Report main screen appears, shown in Figure 4-5.

2 **Review the screen text and click *Next* to begin the problem report.**

The Customer Information screen appears.

3 **Enter your company name, address, contact name or names, phone number, and e-mail address.**

4 **Click *Next* to display the Computer Information screen, shown in Figure 4-6.**

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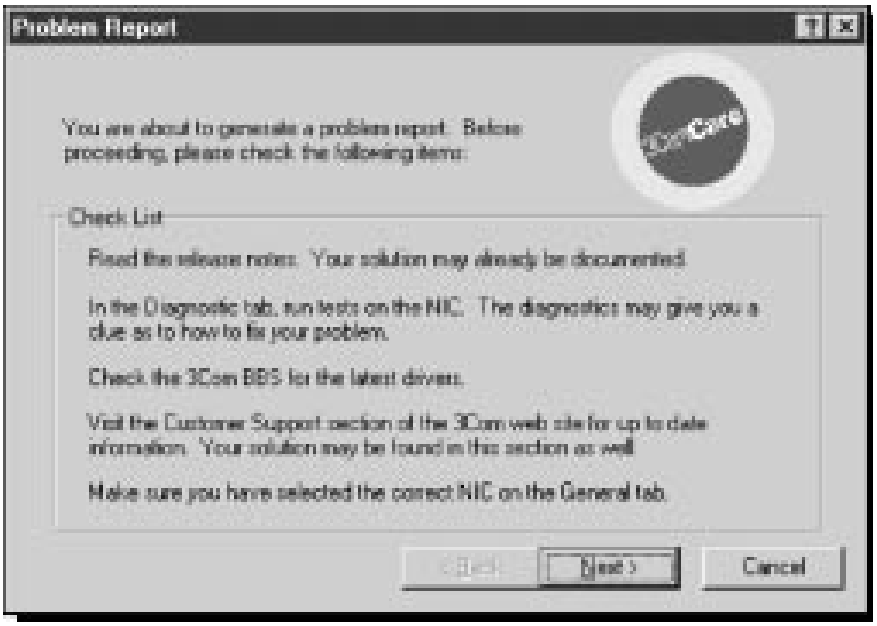
Problem Report
You are about to generate a problem report. Before proceeding, please check the following items:
Check List
Read the release notes. Your solution may already be documented.
In the Diagnostic tab, run tests on the NIC. The diagnostics may give you a clue as to how to fix your problem.
Check the 3Com BBS for the latest drivers.
Visit the Customer Support section of the 3Com web site for up to date information. Your solution may be found in this section as well.
Make sure you have selected the correct NIC on the General tab.
< Back
Next >
Cancel

Figure 4-5 Problem Report Main Screen

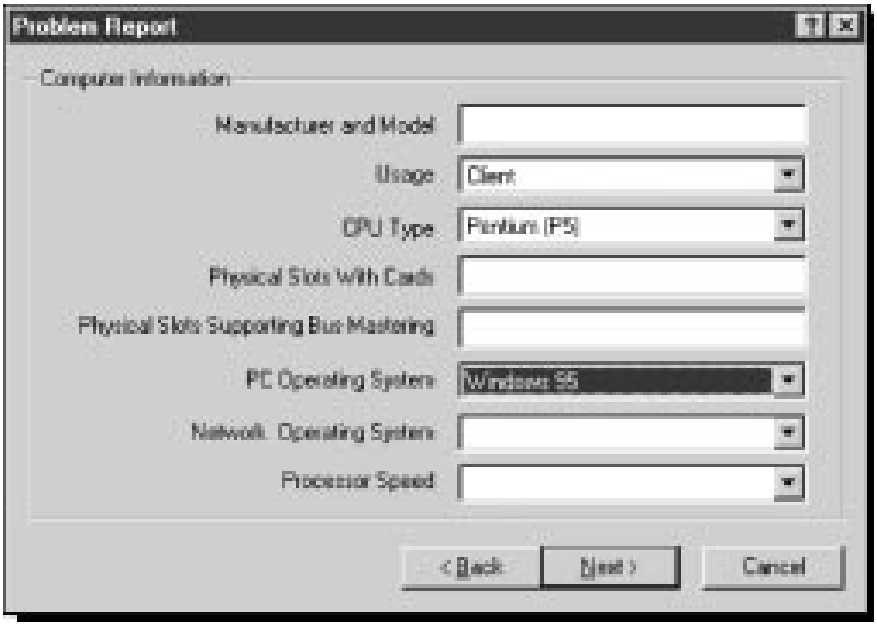

Figure 4-6 Computer Information Screen

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5 **Enter the following information to complete the form:**

   a Enter the PC manufacturer and model of your PC.

   b Identify your PC as a client, server, or both, using the pull-down menu.

   c Select your CPU type using the pull-down menu.

   d Enter the numbers of the PC slots that have boards installed.

   e Enter the numbers of the PC slots that support bus mastering.

   f Select your PC operating system using the pull-down menu.

   g Select your network operating system using the pull-down menu.

   h Select your PC processor speed using the pull-down menu.

6 **Click *Next* to display the Problem Description screen.**

7 **Enter your problem description and the 3Com case number if you have one.**

8 **Use the pull-down menu to select whether you can reproduce the problem or not, and if so, how often.**

9 **Click *Next* to display the Save screen.**

10 **Click *Finish* to save the report to the C:\3REPORT.TXT file.**

   The Send Report screen appears. Use your mail application to mail the report to one of the addresses on the Send Report screen. Contact your local reseller first, before you e-mail the report.

   The problem report is completed. To view the report, click *View Report*.

11 **Click *OK*.**

12 **The 3Com NIC Diagnostics Program General screen appears, as shown in Figure 4-2.**

   To exit the program, click *Cancel*.

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Removing the 3C905B-TX NIC PACE and 3NICDIAGS Software

You can remove the PACE and 3NICDIAGS software from your PC using Windows 95, Windows NT, or DOS.

Windows 95 and Windows NT 4.0

To remove the PACE and 3NICDIAGS software, follow these steps:

1. **In the Windows Control Panel, select *Add/Remove Programs*.**
2. **Select *3Com NIC Diagnostic Utilities*.**
3. **Click *Add/Remove*.**

   The 3C905B-TX NIC software is removed from your PC.

DOS

To remove the PACE and 3NICDIAGS software, follow these steps:

At the DOS prompt, enter:

```
un3c90x.exe
```

The program removes the 3C905B-TX software.

Checking the Remote Wake-up Function

If the PC does not boot up when a Magic Packet™ wake-up packet is sent, perform these general troubleshooting steps:

1. **Verify that the Wake on Link and Wake on Magic Packet settings are enabled.**

   a Click the *Network Neighborhood* icon.

   b Click *Properties*.

   c Double-click the *3Com NIC* icon and click the Advanced tab.

   Make sure that Wake on Link and Wake on Magic Packet are enabled. If these settings do not exist, either the NIC is not a Remote Wake-Up NIC or the driver installation file is outdated. For the latest 3C905B-TX drivers and installation files, download *EtherDisk* diskette 3.1 or later from the 3Com Web site:

   `http://www.3com.com/`

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2 Verify the driver version.

The driver must be at least version 2.23.40.

a Click *Properties*.

b Click the Version tab.

c Check the EL90X.SYS driver version.

If the version is lower than 3.1, download an updated version of the driver from the 3Com Web site:

`http://www.3com.com/`

3 If the version of the driver is up to date, the keywords are enabled, and the PC still does not wake up, check the BIOS.

a Boot the PC and enter the BIOS.

b Locate the Wake-Up on PME signal or Wake-Up on LAN event setting.

c Verify that the setting is enabled.

If you experience difficulties locating these settings, consult the reference manual for your PC, or contact your PC vendor.

4 Remove the PC cover and check the Remote Wake-Up connection.

Verify that the Remote Wake-Up cable is plugged in to the NIC as well as to the motherboard. Unplug and reinsert the cable if necessary.

5 If the NIC still does not wake up, install a known good working Remote Wake-Up NIC and the Remote Wake-Up cable in the PC and recheck the PC.

If the PC works, contact your network vendor for a replacement of the 3Com NIC. After you verify with a known good working NIC that the PC still does not wake up, there may be a problem with the motherboard. Contact your PC vendor.

3Com DOS Diagnostic Program

For information about running the 3Com DOS diagnostic program, see the INSTRUCT.TXT text file in the HELP directory on *EtherDisk Diskette #1*.

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Crossover Cable Troubleshooting Tips

When you work with network cabling, concentrators, and NICs from different vendors, it is possible to connect everything and still have no communication between file servers and workstations.

When there are several unknown variables, it is difficult to determine which component is broken. Use these tips to isolate the problem.

1 **Determine whether your equipment complies with the 10BASE-T or 100BASE-TX standard.**

This is particularly important for concentrators (hubs or repeaters).

2 **Connect a straight-through cable from the PC to the hub.**

The hub performs an internal crossover so that the signal can go from TD+ to RD+ and TD– to RD–. When you look at an RJ-45 connector from the front, pin 1 is identified on the left-hand side when the metal contacts are facing up.

3 **Make sure that the TD+ and TD– wires are twisted together, and that the RD+ and RD– wires are twisted together. The example in Figure 4-7 shows 10BASE-T cabling.**

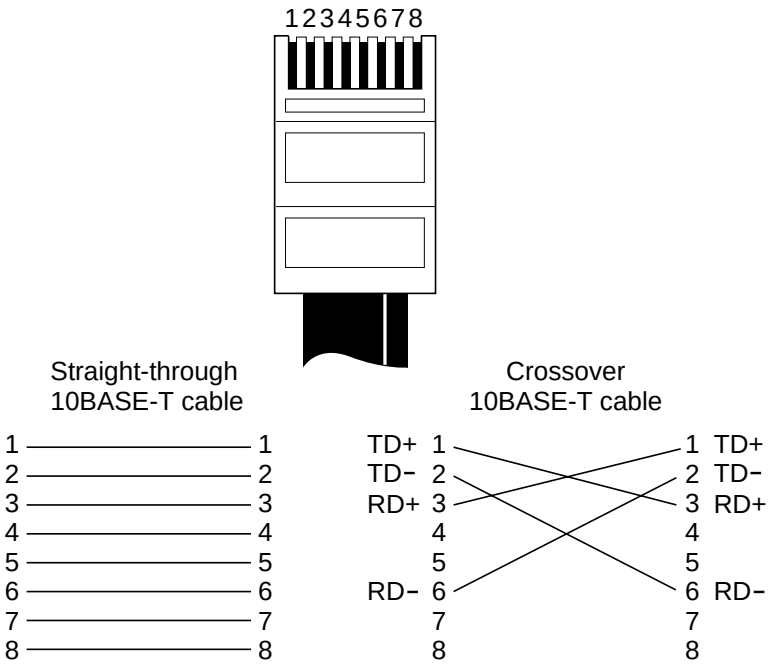

Figure 4-7 Straight-through and Crossover Cable Pinouts

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Using wires from opposing pairs can cause signals to be lost. For a 100BASE-TX cable, pins #1 and #2, and #3 and #6 must be on the same twisted strand.

Troubleshooting Hubs with Crossover Cable

When there is doubt whether a hub is performing correctly, or if the impedance settings are in question, a crossover cable can help you isolate the failing component.

1 **Connect a file server and a client PC back to back with a crossover cable to verify that the NIC and network operating system are properly configured.**

2 **To make a crossover cable, simply connect TD+ to RD+ and TD– to RD–.**

The cable performs the crossover that is usually performed by the hub. Make sure that two twisted-pair wires are used. Figure 4-7 shows the pinouts for the crossover cable. On the straight-through cable, make sure that the wires are from the same twisted pair.

If the file server and client PC function together as a small network, then either the existing cabling or the hub is the problem.

- If there is a proper crossover, the appropriate LED comes on.
- If there is a straight-through connection, the LED does not light.
- A blinking LED indicates that there is a polarity mismatch (that is, TD+ to RD– instead of TD+ to RD+).

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Frequently Asked Questions

Table 4-2 describes some common questions and answers about the 3C905B-TX NIC.

Table 4-2 Frequently Asked Questions

Question	Answer
Which PCI slot is best for my PCI NIC?	3Com PCI NICs are designed to work in any bus mastering PCI slot, preferably slot 1. Avoid any PCI slot next to an ISA slot. This is often a shared slot and does not support bus mastering.The NICs perform best in those slots that support bus mastering data transfers. Refer to your PC manual for information on which slots support bus mastering data transfers.
Do I have to configure the 3C905B-TX NIC?	PCI is a self-configuring bus architecture. Most of the time you only need to install the board in your PC; PCI does the rest. However, on some PCI computers, you may be required to configure the computer's BIOS manually after installing your PCI NIC. Refer to the owner's guide for your PC.
What interrupts should I avoid?	You should avoid using any interrupts used by ISA/EISA boards that do not properly support shared interrupts (level-triggered). If you do not know or are unsure whether other devices or adapters in your PC support shared interrupts, then avoid using them. Avoid using the same interrupt as your local hard drive (normally IRQ 14 for IDE drives and IRQ 11 for most SCSI host adapters), since not all hard drives support shared interrupts at this time. Avoid using 9 because it cascades with 2. For Novell NetWare servers, avoid using IRQ 7 or 15. These IRQs only support nonshared devices and may cause problems if they are shared between two devices.
Are my Fast EtherLink XL network drivers Microsoft-certified?	Yes, the Fast EtherLink XL network drivers are Microsoft-certified.
Are my Fast EtherLink XL Bus Master ODI drivers Novell-certified?	Yes, the Fast EtherLink XL ODI drivers are Novell-certified.

(continued)

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Table 4-2 Frequently Asked Questions (continued)

Question	Answer
How do I remove the 3Com icon from my system tray?	**1** Double-click the *3Com* icon to start the 3Com NIC Diagnostics program. **2** In the right bottom corner of the main window, click the Enable Tray Control check box to remove the check mark. **3** Exit the program and the icon will not appear anymore.
How can I get a SCO driver?	You can get the SCO driver from the 3Com World Wide Web site. **1** Enter the 3Com URL: **`http://www.3com.com/`** **2** Click *Drivers*. **3** Click *Latest Drivers*. **4** Download the required files. ■ 90XSCO3.EXE is for SCO Open Desktop. ■ 90xSCO5.EXE is for SCO Open Server.
How can I remove the 3C905B-TX PACE and 3NICDIAGS software?	**1** In the Windows 95 Control Panel, select *Add/Remove Programs*. **2** Select *3Com NIC Diagnostic Utilities*. **3** Click *Add/Remove*. The PACE and 3NICDIAGS software is removed from your PC.
Does the 3C905B-TX NIC support full-duplex?	Yes, the 3C905B-TX NIC supports full-duplex at 10 Mbps and 100 Mbps operation.
Why does the 3C905B-TX NIC install as a "Generic PCI Ethernet Controller" under Other Devices in the Device Manager?	When Windows 95 is installed with the 3C905B-TX NIC already installed, Windows 95 installs the 3C905B-TX NIC as a generic PCI Ethernet controller. To work around this problem, follow these steps: **1** In the Device Manager, double-click *Other Devices*. **2** Click *PCI Ethernet Controller*. **3** Click *Remove*. **4** Restart your PC.
Does the 3C905B-TX NIC support Windows NT version 3.51 on the DEC Alpha PC?	No, the 3C905B-TX NIC network driver only supports Windows NT 4.0.

(continued)

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Table 4-2 Frequently Asked Questions (continued)

Question	Answer
What should I do if a yellow exclamation point appears next to the 3C905B-TX NIC name?	**1** In the Device Manager, double-click *Other Devices*. **2** Click *PCI Ethernet Controller* or the duplicate 3C905B-TX NIC entry. **3** Click *Remove*. **4** Restart your PC.
What is the hardware IP header checksum?	The header checksum is a field in the IP header. When the 3C905B-TX NIC receives IP data, it computes the IP header checksum, and if an error occurred, the packet is dropped and is not passed to the protocol stack. By computing the CRC through hardware, the NIC can increase the performance of IP traffic and reduce CPU processing required by the protocol stack. To avoid having the CRC computed twice (once in the hardware and again in the software by the protocol stack), make sure that your IP protocol does not compute the CRC or if it does, disable that function.
Does the 3C905B-TX NIC support NetWare versions 3.11 or 4.0x?	The 3C905B-TX does not support NetWare versions 3.11 or 4.0x. These versions require the use of a server driver that conforms to the HSM 3.2 specification. 3Com no longer develops NetWare server drivers to the HSM 3.2 specification.
What does Remote Wake-Up do?	Remote Wake-Up powers up a PC remotely from standby or suspend mode using a wake-up packet that is sent through the LAN. With this method, no one has to be at the PC to turn it on. Remote Wake-Up is also known as Wake on LAN.
How can I tell if my PC supports Remote Wake-Up?	Check to see if there is a 3-pin header for the Remote Wake-Up connector located on the PC motherboard and if your PC has a BIOS that supports wake-up events based on LAN events. If you are unsure, contact your PC vendor for further details.
What can wake up the 3C905B-TX NIC?	The NIC can be awakened by a Magic Packet wake-up packet sent by management software, or by connecting or disconnecting the TP cable.

(continued)

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Table 4-2 Frequently Asked Questions (continued)

Question	Answer
What is a Magic Packet?	A Magic Packet is a valid Ethernet packet that contains a synchronization stream immediately followed by 16 repetitions of the destination MAC address. This Magic Packet is not protocol-specific as long as the protocol contains the sync stream and the 16 repetitions. This Magic Packet can be routed in order to wake up a remote PC. Since it is a valid Ethernet address, the Remote Wake-Up NIC can accept broadcast or multicast packets.
What is a cable connect/disconnect?	The NIC can also be awakened by connecting or disconnecting the network cable.
What is Fast IP?	Fast IP is software that improves performance on switched networks. Fast IP allows end systems (desktops and servers) to discover switched communication paths. By creating switched shortcuts, Fast IP allows end stations to bypass the router and transfer data across wire-speed switched paths. Fast IP is part of 3Com's Dynamic*Access* software, an advanced network driver that brings intelligence to end systems to provide improved network performance and control.
What are the PC and network requirements to run Fast IP?	Client requirements: PC running Windows 95 or Windows NT (versions 4 or 3.51), 3Com 3C905B-TX NIC, and the TCP/IP stack Network requirements: Switched path between stations and single broadcast domain
What are the network configuration requirements for Fast IP?	Fast IP is designed to bypass the router, particularly where the router is a bottleneck, as well as to leverage the switched infrastructure. For Fast IP to create shortcuts around routers, there must be a switched path between source and destination.
What is the performance gain when using Fast IP?	Fast IP bypasses the router to provide increased performance in switched networks even if only a small number of network nodes use Fast IP. The performance gain obtained when deploying Fast IP is directly related to traffic load on the backbone router. The more traffic pumped to the router, the greater the latency and response time and the higher the performance gain. Internal tests show performance increases on the order of 600% when routers are loaded at 70 to 75%.

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Accessing the 3Com World Wide Web Page

The 3Com Web site features news and information about 3Com products, customer service and support, 3Com's latest drivers, technical information, and more.

To access 3Com's World Wide Web site, enter the 3Com URL into your Internet browser:

`http://infodeli.3com.com/infodeli/swlib/n_i_c.htm/`

The Customer Support section has the latest troubleshooting tips for 3Com NICs.

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5 CHANGING CONFIGURATION

This chapter describes how to display and change configuration settings for the 3C905B-TX NIC using the 3Com NIC Diagnostics program.

Before you change the settings, contact your system administrator.

Configuration Settings

Table 5-1 lists each configuration option, the default setting, and the available settings.

Table 5-1 Option Settings

Option	Default Setting	Available Settings
Network Driver Optimization	Normal	Minimize CPU Utilization, Maximize Network Performance, Normal
Full-Duplex	Auto Select	Enabled, Disabled, Auto Select
Boot PROM	Disabled	Disabled, 8K, 16K, 32K
Media Type	Auto Select	100BASE-TX, 10BASE-T, Auto Select
PACE	Disabled	Enabled, Disabled
NDIS Driver Speed	None	100 Mbps, 10 Mbps (Windows NT only), N/A (Windows 95)
Remote Wake-Up	No	Yes, No

CAUTION: *Before setting the 3C905B-TX NIC for full-duplex, make sure that the switch port is also set to full-duplex or supports full-duplex and auto-negotiation (NWay).*

Full-duplex at 100 Mbps improves the performance of switch (hub) connections. The 3C905B-TX NIC supports full-duplex at 10 or 100 Mbps. If the switch supports the NWay feature and full-duplex, the 3C905B-TX NIC automatically runs in full-duplex.

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Displaying Configuration Settings

If you are running Windows 95 or Windows NT, use the 3Com NIC Diagnostics program to display and change configuration settings.

The 3Com NIC Diagnostics program is automatically installed with the network driver. Driver installation is described in Chapter 3.

To display the current configuration of the 3C905B-TX NIC using the 3Com NIC Diagnostics program, follow these steps:

1. **Make sure that the 3C905B-TX NIC is installed and connected to the network (Chapter 2) and the network driver is installed (Chapter 3).**
2. **Start the 3Com NIC Diagnostics program by clicking the Windows *Start* menu.**
3. **Select *Programs*.**
4. **Select *3Com NIC Utilities*.**
5. **Select *3Com NIC Diagnostics*.**

   The 3Com NIC Diagnostics Program General screen appears, as shown in Figure 5-1.
6. **Click *NIC Details* to display the NIC Details screen.**

   Each configuration setting is displayed with the current value. Use the scroll bar to display the full list.

Click the Help button to display Help for this screen. Click the question mark (?) at the top of the screen, drag it to a value, and click. The pop-up box displays information about the selected value.

Changing Configuration Settings

To change the 3C905B-TX NIC configuration settings with the 3Com NIC Diagnostics program, follow these steps:

1. **Click the Properties tab on the 3Com NIC Diagnostics General screen, shown in Figure 5-1.**

   The 3Com NIC Diagnostics Properties screen appears, as shown in Figure 5-2.

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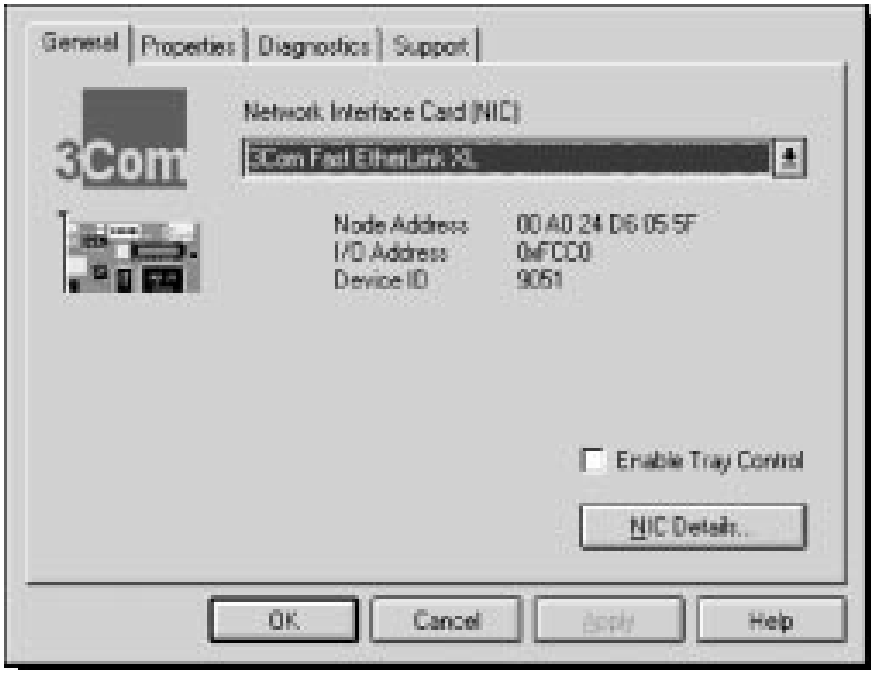

Figure 5-1 3Com NIC Diagnostics Program General Screen

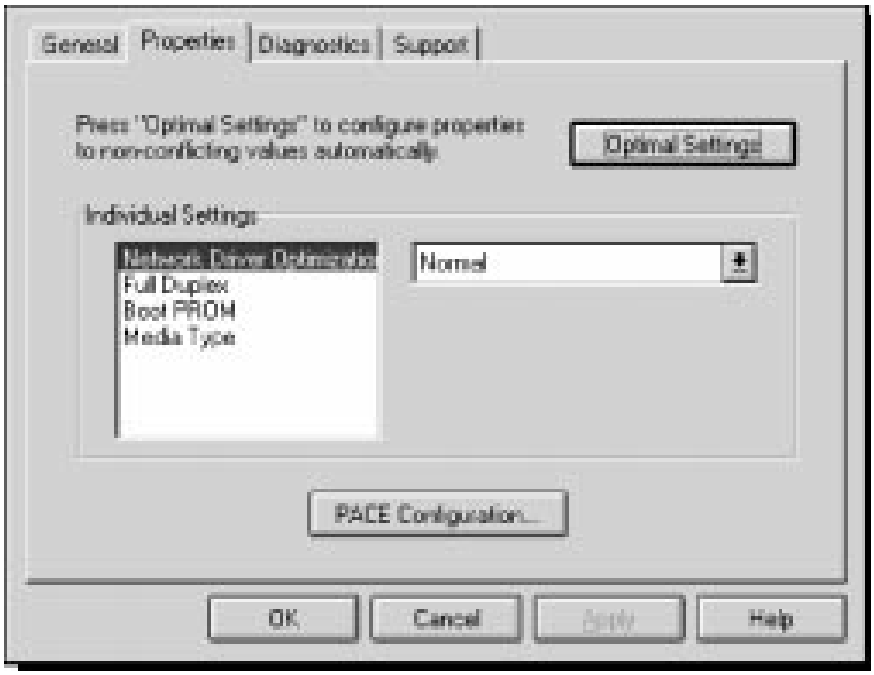

Figure 5-2 3Com NIC Diagnostics Properties Screen

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2 **To display the options for each setting, select the setting and scroll through the options pull-down menu to the right.**

Click the Help button to display Help for this screen. Click the question mark (?) at the top of the screen, drag it to a value, and click. The pop-up box displays information about the selected value.

3 **To select a new value, use the pull-down menu and release the mouse button at the value you want.**

4 **Click *OK*.**

The new value is selected. Repeat the process to change any configuration setting on the Properties screen. Click *OK* to save values or *Cancel* to exit without saving values.

Changing PACE Configuration

PACE technology allows you to establish class of service in order to prioritize multimedia and real-time data. Prioritization makes sure that critical data for the selected applications gets through as fast as possible. To use PACE technology, you must have a switched connection over 3Com switches that are enabled for PACE technology.

Selecting PACE Applications

To select PACE applications, follow these steps:

1 **On the Properties screen shown in Figure 5-2, click *PACE Configuration*.**

The PACE Applications screen appears.

For the PACE driver to recognize high-priority network traffic, it must know if a stream of network traffic was generated by a specific PACE application.

2 **To enable PACE support for an application, click the box next to the appropriate application name.**

3 **Click *OK*.**

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Changing PACE Ranges and Protocols

You can add information for PACE applications not listed on the PACE Applications screen. You must specify the port or socket ranges as well as the network protocol being used. Refer to the PACE application user guide. The PACE network driver uses these ranges to determine whether a packet should be treated as high-priority.

1 **To add the PACE ranges and protocols, click the Additional Ranges tab.**

The PACE Additional Ranges screen appears.

2 **Enter the beginning of the port or socket range for the application in the Range Start box.**

The range should be a four-digit hexadecimal value.

3 **Enter the Range End value of the port or socket range for the application.**

The range end should be a four-digit hexadecimal number. If only one port or socket is needed, Range End should match Range Start.

4 **Select the protocol that the application uses.**

The protocol can be TCP, UDP, or IPX. Some applications support multiple protocols and have port or socket ranges for each protocol. In this case, the range or protocol must match the protocol on the PC.

For example, if only TCP/IP is installed, do not enter the socket range for IPX; otherwise, you could experience a decrease in performance.

5 **Once the Range Start, Range End, and Protocol are entered, click *Add*.**

The range is added to the list.

To remove a range, select the range in the list and click *Remove*.

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PACE Advanced Options

PACE Advanced Options are used to fine-tune the way the network driver handles types of PACE traffic. In general, these values need not be altered. Contact your network administrator before using these options.

1 **To display the PACE Advanced Options screen, click the Advanced Options tab on the PACE Applications screen.**

The PACE Advanced Options screen appears.

2 **Enter new information as required.**

3 **Click *OK* to set the new value.**

To review the PACE settings descriptions, click *Help* on the PACE screens.

Setting Fast IP

You can use Fast IP to improve performance in an environment where most servers and clients are attached to a switched network. Contact your system administrator before you implement Fast IP.

You must have the 3C905B-TX NIC installed and be running either Windows 95 or Windows NT with TCP/IP enabled. In this environment, any application that uses TCP/IP or Microsoft Networking over TCP/IP, FTP, or HTTP can use Fast IP.

For a detailed explanation of Fast IP, go to the 3Com Web site at:

`http://www.3com.com/`

1 **Click the Fast IP tab on the PACE Applications screen.**

2 **To enable Fast IP, click *Fast IP enabled* on the Fast IP screen.**

3 **Click *OK* to save the change.**

Using the DOS Configuration Program

To use the DOS diagnostic program, see the INSTRUCT.TXT file in the HELP directory on *EtherDisk Diskette #1*.

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A SPECIFICATIONS

This appendix lists the specifications and connector pin assignments for the 3C905B-TX NIC.

Specifications

Network Interface

10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 Mbps baseband CSMA/CD local area network
100 Mbps Ethernet 100BASE-TX	Ethernet IEEE 802.3u industry standard for a 100 Mbps baseband CSMA/CD local area network

Physical Dimensions

Height:	8.57 cm (3.75 in.)
Length:	12.07 cm (4.75 in.)

Environmental Operating Range

Operating temperature:	0˚ to 70 ˚C (32˚ to 158 ˚F)
Humidity:	10 to 90% noncondensing

Power Requirements

Operating voltage:	+5 V ± 5% @ 650 mA max

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RJ-45 Connector Pin Assignments

Figure A-1 shows the RJ-45 connector pin assignments for the 3C905B-TX NIC.

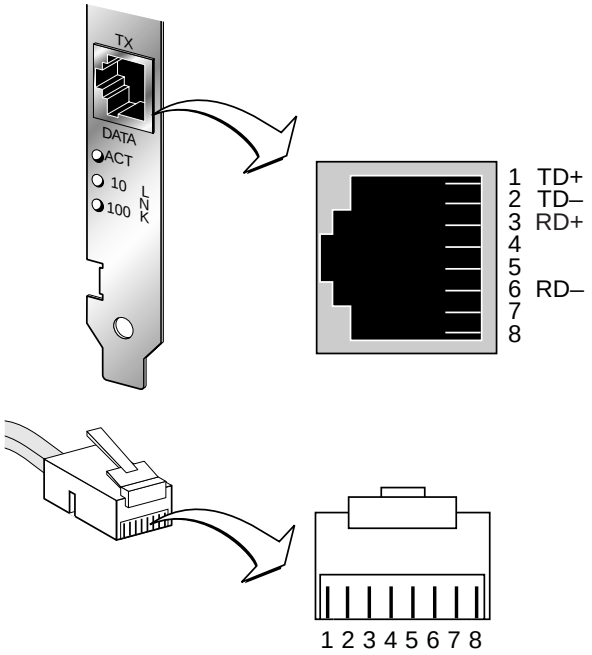

Figure A-1 RJ-45 Connector Pin Assignments

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B TECHNICAL SUPPORT

Support from Your Network Supplier

If additional assistance is required, contact your supplier for support and service of your 3Com network interface card. When you contact your supplier for assistance, have the following information ready:

- Diagnostic error messages
- A list of system hardware and software, including revision levels
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, we recommend that you access 3Com Corporation's World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Bulletin Board Service (3ComBBS)
- 3ComFacts℠ automated fax service

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World Wide Web Site

Access the latest networking information on 3Com Corporation's World Wide Web site by entering our URL into your Internet browser:

http://www.3com.com/

This service features the latest information about 3Com solutions and technologies, customer service and support, news about the company, *Net Age*® Magazine, technical documentation, and more.

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	61 2 9955 2073
Brazil	up to 14400 bps	55 11 5181 9666
France	up to 14400 bps	33 1 6986 6954
Germany	up to 28800 bps	4989 62732 188
Hong Kong	up to 14400 bps	852 2537 5601
Italy	up to 14400 bps	39 2 27300680
Japan	up to 14400 bps	81 3 3345 7266
Mexico	up to 28800 bps	52 5 520 7835
P.R. of China	up to 14400 bps	86 10 684 92351
Taiwan, R.O.C.	up to 14400 bps	886 2 377 5840
U.K.	up to 28800 bps	44 1442 438278
U.S.A.	up to 28800 bps	1 408 980 8204

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Access by Digital Modem

ISDN users can dial in to 3ComBBS using a digital modem for fast access up to 56 Kbps. To access 3ComBBS using ISDN, use the following number:

1 408 654 2703

3ComFacts Automated Fax Service

3Com Corporation's interactive fax service, 3ComFacts, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone using one of these international access numbers:

Country	Telephone Number
U.K.	44 1442 438279
U.S.A.	1 408 727 7021

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GLOSSARY

10BASE-T

The IEEE 802.3 standard for a 10 Mbps baseband network on twisted-pair cable.

100BASE-T

The IEEE 802.3 standard for a 100 Mbps baseband network over twisted-pair cable.

100BASE-TX

The IEEE 802.3 standard for a 100 Mbps baseband network over two-pair Category 5 UTP or STP wire.

dRMON

Distributed RMON. The 3C905B-TX NIC SmartAgent intelligent agents collect remote management information and send it to the Transcend Edge Monitor System to provide full RMON network management in switched and Fast Ethernet networks.

Dynamic*Access* software

3Com proprietary technology that optimizes network performance. Dynamic*Access* features include PACE Interactive Access technology, dRMON (distributed RMON) support, Efficient Multicast Control, and support for PACE real-time and multimedia class of service applications.

full scatter gather

Technique that reduces CPU utilization by coordinating multiple storage locations for received data with no CPU utilization and then collecting it from multiple memory locations for transmission.

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infinite bursting

Technology that enables the 3C905B-TX NIC to move data continuously across the PCI bus without breaks in the data transfer previously caused by cache size limitations. Previously, cache limitations caused the NIC to release and reacquire the PCI bus after every 64-byte burst. Infinite bursting increases throughput and reduces CPU utilization for better performance.

NDIS

Network Driver Interface Specification. Defines the network driver architecture and interfaces that let a PC support NICs. This architecture provides a standardized way to write drivers for network NICs.

network interface card (NIC)

Network interface card. Also called adapter.

10/100 auto-negotiation (NWay)

Signaling scheme that allows the NIC and the hub to negotiate between 10BASE-T and 100BASE-T, and automatically select the highest performance level supported by both devices.

PACE technology

Technology that enhances both real-time, interactive applications and multimedia (data, voice, and video) applications by enhancing network bandwidth utilization, reducing latency, controlling jitter, and supporting multiple traffic priority levels.

Parallel Tasking II architecture

3Com's third-generation Ethernet NIC architecture. Parallel Tasking technology accelerates data transfer by processing data packets simultaneously instead of sequentially.

PCI

Peripheral Component Interconnect. An advanced high-performance local bus that supports multiple peripheral devices. At 33 MHz, the PCI bus transfers data at up to 1056 Mbps.

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3Com Corporation LIMITED WARRANTY

HARDWARE

3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its Authorized Reseller:

Network interface cards	Lifetime
Other hardware products (unless otherwise specified in the warranty statement above)	1 year
Spare parts and spares kits	90 days

If a product does not operate as warranted above during the applicable warranty period, 3Com shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

SOFTWARE

3Com warrants that the software programs licensed from it will perform in substantial conformance to the program specifications therefor for a period of ninety (90) days from the date of purchase from 3Com or its Authorized Reseller. 3Com warrants the media containing software against failure during the warranty period. No updates are provided. The sole obligation of 3Com with respect to this express warranty shall be (at the discretion of 3Com) to refund the purchase price paid by Customer for any defective software products, or to replace any defective media with software which substantially conforms to applicable 3Com published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty or representation that its software products will work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error-free, or that all defects in the software products will be corrected. For any third-party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the noncompatibility is caused by a "bug" or defect in the third party's product.

STANDARD WARRANTY SERVICE

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FCC CLASS B STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules, and the Canadian Department of Communications Equipment Standards entitled, "Digital Apparatus," ICES-003.These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from the one which the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for help.

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The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

NOTE: In order to maintain compliance with the limits of a Class B digital device, 3Com requires that you use quality interface cables when connecting to this device. Changes or modifications not expressly approved by 3Com could void the user's authority to operate this equipment. Refer to the manual for specifications on cabling types.

FCC Declaration of Conformity

We declare under our sole responsibility that the

Model:	**Description:**
3C905B-TX	Fast EtherLink XL PCI 10/100BASE-TX
3C905B-TX-NM	Network Interface Card

to which this declaration relates, is in conformity with the following standards or other normative documents:

- ANSI C63.4-1992 Methods of Measurement
- Federal Communications Commission 47 CFR Part 15, subpart B
  15.107 (e) Class B Conducted Limits
  15.109 (g) Class B Radiated Emissions Limits

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